DOCUMENT RESUME

ED 223 322 PS 013 150

AUTHOR Altus, Grace T.; Altus, William D.
TITLE Handedness, Birth Order, Reading Problems: Referrals to a School Psychologist.
PUB DATE Aug 82
NOTE 9p.; Paper presented at the Annual Meeting of the American Psychological Association (90th, Washington, DC, August 23-27, 1982). Best copy available; may not reproduce well.
PUB TYPE Speeches/Conference Papers (150) -- Reports - Research/Technical (143)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Birth Order; Elementary Education; *Elementary School Students; *Intelligence Quotient; Left Handed Writer; Matched Groups; *Reading Difficulties; Referral; Twins
IDENTIFIERS *Handedness

ABSTRACT

To investigate the influence of handedness in the referral of elementary school students to a school psychologist, 120 left-handed referrals were matched with 120 right-handed referrals by sex, full-scale intelligence quotient, and chronological age. Comparison of the groups revealed that twins were more numerous among the left-handed students. Right-handed children did somewhat better than left-handed on Wechsler verbal items, while left-handed students scored higher than right-handed on performance items. Intelligence deficits did not appear to be involved in reading deficits of left-handed boys. More firstborns were found among left-handed children with reading problems; fewer firstborns were found among the gifted than would be expected statistically. Thus, Bakan's birth-order theory is possibly supported by the findings. Additionally, it was found that Wechsler subtest patterning for right- and left-handed children is generally congruent. (Author/RH)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED223322

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
X This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

SUMMARY

Handedness, Birth Order, Reading Problems: Referrals to a School Psychologist

Grace T. Altus
School Psychologist, Goleta Union School District, California

William D. Altus
University of California, Santa Barbara

120 left-handed elementary-school psychological referrals were matched with 120 right-handed referrals by sex, full-scale IQ, and CA. Twinning was significantly more frequent among the left-handed. Right-handed did somewhat better on Wechsler verbal items, left-handed on performance items. Boys predominated among severe reading problems but were significantly brighter than other male lefties (emotional, behavioral problems). More firstborns are found among left-handed with reading problems and fewer among the gifted than statistical expectancy, thus possibly supporting Bakan's birth-order theory. Wechsler subtest patterning for right- and left-handed is generally congruent.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Grace T. Altus
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

PS013150

Handedness, Birth Order, Reading Problems: Referrals to a School Psychologist

Grace T. Altus
School Psychologist, Goleta Union School District, California

William D. Altus
University of California, Santa Barbara

The senior author has approximately 1,000 file cards on elementary-school pupils referred to her in the past decade. These cards contain psychometric data (if tests are given), plus (usually) birth order, names and ages of siblings, handedness, diagnosis, and disposition. A previous report (Altus & Altus, 1980) derived from these file cards emphasized birth-order effects. It was noted in this study that left-handedness was more prevalent among the referrals than chance would allow.

The present study concerns 120 left-handed referrals who were tested on various Wechsler scales (WISC, 50; WISC-R, 34; WPPSI, 16) and the Stanford-Binet (N, 20). For each left-handed S, a right-handed control of the same sex, chronological age, and approximate full-scale IQ was selected. The presumptive influence of handedness in the referral could thus be investigated.

Results

Three-fourths of the left-handed tested on the three types of Wechsler scales were boys, 75 of the 100 total. The Binet (used to select for gifted classes) yielded only 9 boys out of the 20 left-handed, however. The school psychologist soon learns that boys predominate among teachers' referrals because of their marked excess among the reading, learning, and behavior problems.

WISC Differentials

Table I shows a number of statistically significant differences between the left- and right-handed. The 50 left-handed (39 boys; 11 girls) tested

on the WISC were quite well matched on mean full-scale IQ with the right-handed controls, as the appended graphical representation will show. The right-handed were significantly superior in mean score on WISC Verbal IQ, while the left-handed were superior, though not significantly so, on the performance tests. The subtests on the WISC verbal section where the right-handed were superior in a statistically significant sense were (1) Information and (2) Digit Span. On three performance subtests (Picture Completion, Picture Arrangement, and Block Designs) the left-handed earned higher mean scores, though not significantly so.

It may be that the relatively poor performance on the Information subtest by the left-handed is due, in part, to the greater incidence of reading disability among them: More of them are labeled either dyslexic or severe reading problems than are the matching right-handed. Short-term memory is involved in Digit Span, however, and literacy certainly would not seem to be involved in deficiencies therein. One hesitates to invoke hemispherical cortical involvement (as indicated by handedness) since so little is known for certain about hemispherical dominance.

Severe Reading Problems

Girls are overwhelmingly outnumbered in this area, 26 to 3 (Table I), yielding a P = .001 favoring a significant sex difference. Of greater import than this finding, which is not new, is the fact that more of the boys are firstborns, 13, than expectancy, 8, leading to a P = .02. This finding lends some cogency to the report (Bakan, 1971; Bakan, 1977) that left-handedness is more frequent among firstborns, presumptively through hypoxia during labor (but see Hicks, Evans, & Pellegrini, 1978; Hubbard, 1971). As was noted 15 years ago (Altus, 1966) and confirmed by innumerable studies since, the firstborn tends to be brighter than laterborns and to

excel in school. Here we find the left-handed firstborn with reading problems and obviously not excelling in school. The right-handed controls with reading problems have no excess of firstborns (8 out of 25, exactly meeting expectancy, as defined by firstborns in the school population). For a firstborn boy (if Bakan is even partially correct), birth order may well have some etiological influence in his being left-handed and subsequently becoming a severe reading problem in the elementary school.

Whatever the cause of the left-handed boy's reading difficulties, intelligence would not appear to be involved since his mean Performance IQ (WISC) is 112.57, N of 14. For 25 left-handed boys in the present study who had other problems (emotional, behavioral), the comparable mean Performance IQ is 103.57. This difference yields a P = .02, favoring the left-handed boy with the reading problem. For the 14 with reading as a primary problem, their Performance (WISC) subtests (Picture Completion, Picture Arrangement, Block Designs, Object Assembly) all had mean scores of 12 or 13. Their Coding mean was 8.36; Information was 9.71; Arithmetic, 9.29. Hypothetically, the dominant right hemisphere may be effective (for certain of the left-handed who have such dominance) with "things" and do relatively poorly with verbal abstractions. One study (Peterson and Lansky, 1977) showed an excess of left-handed among architectural students and greater success in completion of a 6-year program. Whether the superior performance of the left-handed boys with severe reading problems (WISC performance scales) and the left-handed architects' success are related and whether either or both are linked to the right hemisphere remain, of course, unknown.

Twinning

Twinning is reported as more frequent among the left-handed (Bakan, 1971). The current study found 5 left-handed pupils who were members of twin pairs; 4 others reported twin siblings. Only one right-handed control

was a twin; no other twin members were reported as siblings in this group. This finding washes at the .001 level. The writers commit themselves to no etiological explanation.

The Gifted

The mean Stanford-Binet IQ of the 20 left-handed (9 boys, 11 girls) was 135.2; the mean for the right-handed, 129.1. Eight lefties were firstborn; 11 were laterborns. Thirteen of the right-handed controls were firstborn, while seven were laterborn. What is of interest is that fewer firstborns are found among gifted left-handed elementary-school children, while more are found at the other end of the learning scale, with severe reading problems. In contrast with the general population (Altus, 1966) the intelligence level of the left-handed in the current study appears to be minimally related to birth order. Hicks, et. al., report (1978) that left-handed college students are inferior to right-handed on Cattell's measure of fluid intelligence. Though interesting, Hicks' finding probably is not germane to the population here under scrutiny.

WISC and WISC-R Subtests and Referral to a School Psychologist

When Vocabulary and Block Designs are summed and compared with the sum of Arithmetic and Coding, one finds that for 61 left-handed boys in the current study, 55 times the Vocabulary and Blocks sum exceeded that of Arithmetic and Coding; in two cases the sums were equal; four times (A + C) exceeded (V + BD). Thus, 90% of the 61 left-handed male referrals to a school psychologist had higher (V + BD) scores. For 21 girls, 16 (76%) had (V + BD) exceeding (A + C).

Summary

Though well matched in full-scale IQ on WISC and WISC-R, the right-handed controls were significantly superior (WISC) in mean Verbal IQ to

the left-handed pupils. In general, the left-handed did better than the right-handed controls on the performance subtests, though not to a significant level. The verbal superiority of the right-handed was primarily due to Information and Digit Span subtests, where statistically significant differences obtained.

Only 7 of the 51 severe reading problems in this study were girls and all 7 of them were right-handed; all 25 of the left-handed severe reading problem cases were boys. It should perhaps be emphasized that intelligence, per se, does not seem related to the severe reading problems of the left-handed boy. In WISC Performance IQ the left-handed male with severe disability in reading had a significantly higher mean than did males with other causes for referrals (behavior and emotional problems). Whether the causative agent is the "wiring" of the brain (as hemisphere dominance varies) or pathology introduced by hypoxia at birth, as Bakan hypothesizes, is, of course, beyond our present ken.

Significantly more of the left-handed (primarily boys) were twins or had siblings as twins than was the case for the right-handed controls. This confirms earlier findings relative to twinning and the left-handed.

While birth order was significantly linked to Stanford-Binet IQ in the instance of the 40 pupils (20 left-handed with 20 right-handed controls), fewer of the left-handed referred for testing as possibly gifted were first-born. Conversely, there were significantly more firstborns among those left-handed boys who presented severe reading problems. It appears that (in the elementary school, at least) birth order means less in intelligence and school achievement among left-handed males than it does among the right-handed school population. Whether these findings are related to Bakan's contention that birth trauma is sometimes causative in producing brain

damage and left-handedness can only be conjectured. Certainly Bakan's theory cannot be dismissed out of hand.

For both the WISC and WISC-R, the left-handed child referred to a school psychologist presents a heuristic patterning of subtests: (V + BD) is greater than (A +C) nine times out of ten for male referrals and for three out of four female referrals. One possible interpretation of these ratios might be that a child is frequently referred to a school psychologist because his functioning intelligence (A and C) are below, and often considerably below, his potential for intelligent action (V + BD).

Finally, it should be emphasized (see graph) that, generally speaking, the WISC, WISC-R, and WPPSI subtest profiles of the left-handed are very much like those of the control right-handed population. The left-handed do somewhat better on performance subtests, the right on certain verbal subtests. The differences are not great. The congruity of the subtest profiles is much more striking than any disparity which may be adduced. Whatever differences may possibly obtain between the two populations, dexter and sinister, our current intelligence tests are too crude to measure them in any significant degree.

BIBLIOGRAPHY

ALTUS, W. D. Birth order and its sequelae. Science, 1966, 151, 44-49.

ALTUS, W. D. and ALTUS, GRACE T. Birth order and referrals to a school psychologist. Presented APA, Montreal, 1980.

BAKAN, P. Handedness and birth order. Nature, 1971, 229, 195.

BAKAN, P. Left-handedness and birth order revisited. Neuropsychologin, 1977, 15, 837-839.

HICKS, R. A., EVANS, ELIZABETH A., and PELLEGRINI, R. J. Correlation of handedness and birth order. Perceptual and Motor Skills, 1978, 46, 53-54.

HICKS, R. A., and BEVERIDGE, R. Handedness and intelligence. Cortex, 1978, 14, 304-307.

HUBBARD, J. I. Handedness is not a function of birth order. Nature, 1971, 232, 276-277.

PETERSON, J. M. and LANSKY, L. M. Left-handedness among architects. Perceptual and Motor Skills, 1977, 45, 1216-1218.